To amplify a 20 MHz signal, you can use a simple common-emitter transistor amplifier circuit. Here's how to design it:

Components Needed:

1. NPN Transistor (e.g., 2N2222 or similar with high-frequency capability)
2. Resistors (for biasing)
3. Capacitors (for coupling and bypassing)
4. Power supply (e.g., 9V)

Circuit Design:

1. Transistor: Use a high-frequency NPN transistor like the 2N2222, which has a transition frequency (ft) much higher than 20 MHz.
2. Biasing:
   - Set up the transistor in a common-emitter configuration.
   - Use a resistor divider (R1, R2) to set the base voltage.
   - Use a resistor (RE) at the emitter to stabilize the gain.
   - Use a collector resistor (RC) to define the gain.
3. Coupling and Bypass Capacitors:
   - A coupling capacitor (C1) is placed between the input signal generator and the base of the transistor to block DC.
   - A bypass capacitor (C2) is placed across RE to bypass AC signals and increase gain.
   - Another coupling capacitor (C3) is placed at the output to pass the amplified AC signal to the next stage.

Typical Values:

- R1, R2: Set the base bias voltage. For a 9V supply, R1 = 22kΩ, R2 = 4.7kΩ.
- RC: Collector resistor. Choose a value like 1kΩ.
- RE: Emitter resistor. Choose a value like 220Ω.
- C1, C3: 10nF to 100nF to pass the 20 MHz signal.
- C2: 100nF to 1µF to bypass the emitter resistor for AC signals.

Circuit Function:

- The input 20 MHz signal from the generator is coupled through C1 to the transistor's base.
- The transistor amplifies the signal, and the amplified signal is taken from the collector and passed through C3 to the output.

Key Points:

- Ensure that the transistor you choose has a transition frequency (ft) much higher than 20 MHz.
- Choose the capacitors such that they have low

reactance at 20 MHz ($X_c = 1/(2\pi fC)$).

This simple circuit should provide enough gain to amplify your 20 MHz signal.